Zero Retries issue 0135 2024-01-19

Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its third year of publication, with 1200+ subscribers.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Web version of this issue - https://www.zeroretries.org/p/zero-retries-0135

Request To Send

Commentary by Editor Steve Stroh N8GNJ

Hamvention 2024, Ho!

Hamvention 2024 in Xenia, Ohio, USA countdown - ~~*19*~~ ~~*18*~~ *17 weeks!*

Another "Starlink Just Works" Experience

This week Bellingham (the City of Subdued Excitement) experienced *our* brush with the North American "January 2024 cold snap" with a few days of temps into the single digits and our first 6 inch'ish snowfall of the winter. Through it all, my Starlink user terminal just kept working to provide broadband Internet access to our household, including 4k video streaming. If there was going to be an issue with Low Earth Orbit satellite broadband Internet access, it would seem like the cold temps and significant snowfall would be a challenge. But, Starlink didn't miss a beat, er… byte. I'm sure the unit's Forward Error Correction (FEC) had to kick up a notch or two, slightly lowering the data rate, and the user terminal probably required a few more watts of electrical power to keep the phased array electronics at optimum temperature and keep snow from accumulating on the flat panel, but *it just worked*. Starlink's technology continues to impress me.

Update on The Substack Problem

Summary - I'm resigned to move Zero Retries off Substack in 2024. I don't yet know when, or how, or to where. I'll give plenty of notice. Feel free to skip forward if you don't need to know any more than these basics.

Substack worked well enough for the first few years of Zero Retries - it was a platform that enabled me to get started writing Zero Retries. But now, besides the primary Substack Problem that forced the issue, it's become clear that Substack isn't an optimum platform for the unique content (and niche) of Zero Retries. The two biggest disconnects on the way *I* use Substack to publish Zero Retries are that Zero Retries *isn't seeking profit* (though financial contributions are welcome, and I'm grateful for) and that the "community features" of Substack *aren't a good fit* for Zero Retries.

Allow me an analogy. If Zero Retries were a "brick and mortar business", starting Zero Retries on Substack was akin to renting a storefront in a bad part of town because the rent was affordable and it allowed me to establish the business. But the neighborhood has now gotten toxic, bad stuff is happening all around this neighborhood, and the landlord isn't maintaining the building (and especially the safety of the customers). Fortunately the business is doing well enough that I can consider moving it to a better part of town. But moving the business isn't going to be simple or fast. (End of analogy.)

One limitation I had imposed on my investigation of other hosting systems was an integrated

payment system. With deeper thinking, that's an unnecessary requirement given that I don't intend to ever "paywall" any Zero Retries content. From the beginning of Zero Retries, I committed that Zero Retries content would be available free and publicly accessible to anyone who wants to read it, in perpetuity. Thus I don't need an *integrated* payment system with the capability to paywall content.

But, I also want to be able to accept financial contributions from those that want to help pay for the expenses of Zero Retries, special projects, and incentivize me to continue to publish Zero Retries. To do that, I'll take my cue from the YouTubers who make good use of Patreon for sustaining contributions. For funding special projects, I can use a service such as GoFundMe.

Thus that decision frees me to consider more hosting systems that "only" provide hosting and email integration (which *is* a requirement). In "knowing one's self", self-hosting isn't a realistic option for me.

Thus the plan of the moment to transition Zero Retries to some other hosting system is something like:

- Identify and test publish on a new hosting platform.
- Establish accounts on Patreon and GoFundMe.
- Begin publishing Zero Retries on the new platform and stop publishing on Substack.
- Migrate existing content on Substack Zero Retries to the new hosting platform.
- Complete the transition within 2024.

73,

Steve N8GNJ

Leave a comment

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FCC Docket 16-239 Reply Comments Due 2024-01-22

By Steve Stroh N8GNJ

In response to the ARRL's courageous and admirable recommendation to the FCC that all remaining symbol rate limitations be removed, and bandwidth limits in the VHF and UHF bands be removed (see **Zero Retries 0134** - ARRL Comments - Surprisingly Progressive), there have been a few "ARRL naysayers" who have filed Reply Comments to the ARRL's comments.

In my highly personal opinion, none of the "ARRL naysayers" offer compelling rebuttals to the ARRL's comments, but if the naysayers go unchallenged, their Reply Comments could,

conceivably, carry some weight with the FCC, possibly incentivizing the FCC to not change current bandwidth limits for the VHF / UHF bands, per their statements:

> Concomitantly, we seek comment on the appropriate bandwidth limitation for the 2200 meter band and the 630 meter band as well as on *maintaining the bandwidth limitations already in the VHF and UHF bands*.
>
> …
>
> Alternatively, *should* we consider changing any of the existing bandwidth limitations in the VHF and UHF bands allocated to the amateur radio service?

What's interesting is that the "ARRL naysayers" mostly mention only the ARRL comments, and mostly ignore the individual commenters (including me) who made substantially the same recommendation as ARRL (remove all symbol rates, remove all bandwidth limits for VHF / UHF bands). Thus my characterization of "ARRL naysayers".

As one email I received mentioning the "ARRL naysayers" put it succinctly in suggesting to file comments supportive of the ARRL's comment:

> Everything is helpful.

Thus, in my opinion, it's important for those of us who want to position the Amateur Radio VHF / UHF bands to allow more experimentation with newer radio technologies to do one more round of comments - ***Reply Comments***.

Again, I'm no expert on FCC processes - the following is my best understanding / advice:

Mostly, do the same procedure as before -

- Go to FCC's Electronic Comment Filing System
- Click Submit a Filing
- Choose **Standard Filing** (for a pre-written document) or **Express Comment** (Fill in the form)
    - If choosing Standard Filing, in Type of Filing, select REPLY TO COMMENTS
    - If choosing Express Comment, mention prominently in Brief Comments that you are submitting a **Reply Comment**. This is to insure that your comment will be categorized as being a Reply Comment rather than an initial comment (submitted outside the proscribed window for initial comments).
- In the Proceedings field, type 16-239
- Wait a few seconds for the system to find **16-239 |** Amateur Baud Rate
- Click on **16-239 |** Amateur Baud Rate

- Fill in the blanks

I plan to file my reply comments, concurring with the ARRL comment, and commenting on the "naysayer" reply comments, well before 2024-01-22.

Perhaps we'll see Reply Comments from some of the Organizations That Didn't Show Up.

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David Mills W3HCF, Creator of Network Time Protocol (NTP) is a Silent Keyboard

Per a widely-cited email from Vint Cerf, David Mills W3HCF became a silent keyboard on 2024-01-17.

Amateur Radio was a significant part of W3HCF's life:

> First licensed in 1954…
>
> In fifty years of sometimes sporadic attention to the hobby…
>
> My amateur radio station W3HCF includes two-way voice and data radio transmission equipment covering HF, VHF and UHF amateur bands. It uses modern solid-state gear that replaced an older station using vacuum tubes. The antenna farm on the roof is a local landmark. Any of four radios and several voice and data modes can be remotely controlled and accessed using standard Internet data and multicast audio tools. The radios can run for extended periods without external power for emergency and disaster communications.

Beyond Amateur Radio, W3HCF is best known as the creator of, and a significant contributor to Network Time Protocol (NTP) which has become a critical component of the proper functioning of the Internet, and arguably the primary method of maintaining reasonable synchronization of computing devices.

A 2022-09-30 New Yorker article by Nate Hopper - The Thorny Problem of Keeping the Internet's Time explained the importance of NTP to the public:

> To solve the problem of time synchronization on the arpanet, Mills built what programmers call a protocol—a collection of rules and procedures that creates a lingua franca for disparate devices. The arpanet was experimental and capricious: electronics failed regularly, and technological misbehavior was common. His protocol sought to detect and correct for those misdeeds, creating a consensus about the time through an ingenious system of suspicion. Mills prided himself on puckish nomenclature, and so his clock-synchronizing system distinguished reliable "truechimers" from misleading "falsetickers." An operating system named Fuzzball, which he designed, facilitated the early work. Mills called his creation

> the Network Time Protocol, and N.T.P. soon became a key component of the nascent Internet. Programmers followed its instructions when they wrote timekeeping code for their computers. By 1988, Mills had refined N.T.P. to the point where it could synchronize the clocks of connected computers that had been telling vastly differing times to within tens of milliseconds—a fraction of a blink of an eye. “I always thought that was sort of black magic,” Vint Cerf, a pioneer of Internet infrastructure, told me.

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Techies, Data Communications, and Experimentation with New Radio Technologies Could “Save” Amateur Radio

By Steve Stroh N8GNJ

The original version of this article was way too ambitious (it sprawled…), and more than a bit convoluted. Thus I’m breaking out the ideas I intended to present into more easily digestible articles over several issues of Zero Retries.

There’s a lot happening in Amateur Radio, and especially Amateur Radio in the US. Taken at face value, there are a number of trends that are troubling, to the point that some folks seem to consider Amateur Radio a lost cause. While this discussion will at first seem like it’s “Amateur Radio Politics” (which I generally try to avoid in Zero Retries"), these preliminary points are presented in service to Zero Retries’ mission:

… promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology.

The numbers of Amateur Radio Operators (not just in the US) are declining.

I think this is to be expected given that “be prepared for emergencies, get your Ham license” was *way* oversold to the US general public in the last couple of decades. People studied enough about Amateur Radio to be prepared for the test questions, took the test, got their license, purchased an Amateur Radio portable radio… and were underwhelmed with “the Amateur Radio experience”. There just wasn’t much… or anything… in “the Amateur Radio experience” *for* them. These folks were never in the “pipeline” to upgrade to General or Extra, so when it came time to renew their Amateur Radio license and jump through the hoops at the FCC website to register for an account and pay $35… they shrugged and said “Meh” and their license officially, irrevocably expired.

Another factor is that the Amateur Radio population is currently “trending grayer” and inevitably dying off, concurrent with not as many younger folks coming into Amateur Radio to offset these two sources of non-renewal of Amateur Radio licenses.

The influence of the ARRL will inevitably decline as a result of disgust at the Board of Directors infighting and dues (subscription) price increases.

I take no pleasure in this observation… it just *is*. Without receiving QST, even electronically, amongst the 20% or so of the US Amateur Radio population that are currently ARRL members, ARRL's influence on Amateur Radio, the Amateur Radio community / industry, and the ARRL's influence at the FCC will inevitably decline. Without an *effective* Amateur Radio organization to promote Amateur Radio, recognition of Amateur Radio in general society will decline.

The use of voice VHF / UHF repeaters are significantly reduced, year to year.

When one listens to Amateur Radio repeaters (incredibly easy now even on portable radios) using a scanning function, other than scheduled nets and exercises / emergency simulations, and "drive time" chatting, Amateur Radio repeaters are vastly underused.

Emergency Communications has subtly become less of a justification for Amateur Radio. Simultaneously…

- In the 2020s and beyond, First Responders have more, and more reliable communications options than ever before. A few examples:
    - FirstNet provides priority access on a "hardened" mobile telephone and broadband infrastructure.
    - Iridium Communications provides "works anywhere in the world" satellite telephone and data communications using portable and mobile devices.
    - Starlink for Business offers Broadband Internet Access "anywhere you can see the sky".
    - Thus overall, there is increasingly less need… or use… for Amateur Radio to provide emergency communications… *which is a major justification for the existence of many Amateur Radio repeaters*.
- Communications infrastructure available to most individuals has become more concentrated and fragile. One example is a "landline" provided by a cable company is only good for perhaps one hour in the event of a widespread power outages as the cable infrastructure relies on (limited) battery backup in the distribution network (battery banks on the poles) and an (optional) battery in the cable modem that enables "plain old telephone devices". Another example is many cell sites don't have any effective backup power or redundant backhaul links in case of a fiber cut. *Thus individuals (rather than first responders) could benefit from an emergency communications capability via Amateur Radio*.

COVID-19 and other factors have impacted many Amateur Radio club meetings and other reasons for Amateur Radio in-person events.

Such "social" in-person events reinforced "the Amateur Radio experience". Videoconferences are partially effective to lack or reduced in-person meetings, but when videoconferences are a regular event of one's workweek, it's *not that compelling* to do yet another videoconference during one's personal time.

But even when Amateur Radio clubs and other social events *are* operating, it's unfortunate that newer, especially younger Amateur Radio operators don't find such events interesting or welcoming. Meetings often include too much "internal politics" (business meetings) and presentations about mostly irrelevant subjects such as DXpeditions or the latest $3,000+ HF rig, or even just too much politics. Again, I take no pleasure in the observation that many young folks now check to see if an organization has a formal code of conduct on record, and if not, they're not willing to consider participating in an organization.

The potential audience of younger folks to become new Amateur Radio Operators just don't find "talking to strangers" or "operating on shortwave" to be compelling reasons to become Amateur Radio Operators.

Younger folks are "digital natives" and they are comfortable with data communications (texting, social media, and services accessible via portable or tablet devices). Many live in housing (especially apartments) where traditional HF operations simply isn't an option.

Thus appealing to younger folks by touting the "Amateur Radio experience" of "talking long distances on HF" (or "talking to strangers *at all*" is a non-starter.

The "Solution" for the above? *Reimagine Amateur Radio* to attract techies.

Or, at least some potential, conceivable solutions:

- Create new Amateur Radio capabilities that are relevant and interesting to younger generations, and especially the very large portion of the population that are (or consider themselves) techies.
- Redevelop most Amateur Radio VHF / UHF repeaters to be data-capable (or data-only) to be able to provide "saturation coverage" for simple data communications systems, making it easy and non-frustrating to communicate via data communications systems with others in a fun manner. As a very brief example, imagine a system consisting of1:
    - DigiPi
    - An inexpensive 5 watt VHF / UHF radio
    - A reasonable antenna
    - Running a fast(er) data mode that incorporates Forward Error Correction
    - Using a pleasant application on a handheld or tablet device
- Develop *and promote* the capabilities of these systems to be independent communications systems that don't rely on Internet, or cellular, or even commercial power2.
- When someone obtains an Amateur Radio license… *follow up with them to help them*. Once you get a credit card, inevitably offers for other credit cards follow. If we can do that, surely we can follow up with new Amateur Radio Operators to "help them get

established" in Amateur Radio.

- Adapt the idea of subject-focused talk groups (prominent on Digital Mobile Radio - DMR) to local data communications, such as subscribe to the topics that are most interesting to you similar to the way we once subscribed to usenet news groups… or more recently, email mailing lists.

- Provide ample documentation and other support for "getting on modern Amateur Radio" such as in-person "build your system" meetings, regular videoconference, support forums, and online publications. Set up local, regional, and national "light coordination" organizations.

- Promote this "New Amateur Radio" experience via social media, STEM instruction, technical education, makerspaces, etc.

I'll expound on these ideas in near future issues of Zero Retries.

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

New SW Radiogram [Software Version] Available

Mike Agner on the Digitalradio mailing list:

> Hello to all the digital folks out there.
>
> A new program for the Shortwave Radiogram broadcasts has now been posted on the SW Radiogram website https://swradiogram.net/
>
> If you're new to decoding digital, this is a pretty nice way to get your feet wet. You can use your desktop or laptop, or you can use an Android device such as a smartphone or tablet. You can find links to the SW Radiogram website, software for decoding, and wiki articles with extensive details and help at: http://www.udxf.nl/events.html
>
> If you'd like to see a list of web receivers (which are often reported as being used), receiver, transceiver and SDR applications and more, take a look at the SW Radiogram gateway at https://wiki.radioreference.com/index.php/Shortwave_Radiogram_Gateway
>
> Help is also available on Facebook and Twitter. The SW Radiogram website has

> the links.
>
> Other programming that is known to utilize digital modes during its broadcasts can be found at
>
> https://swradiogram.net/post/7195916222838210 56/transmission-schedules-for-the-mighty-kbc-pop
>
> Here's hoping for good propagation.

I only recently became aware of the existence of the Shortwave Radiogram broadcasts. I think that getting set up to receive the Radiograms is an excellent way to begin understanding radio data modes and you don't have to have a sophisticated or expensive receiver (I'm guessing that many of the inexpensive "receiver dongles" would work) or even have an Amateur Radio license.

Slightly Used Amateur Radio Cartoonist For Hire

Jason Toyger W3MCK (***aka Jay Thurber?***) on his blog:

> **Mother of mercy, is this the end of my magazine cartooning career?**
>
> …
>
> It's been a good run, of 16 years, and I've enjoyed the notoriety it gave me in the hobby. (More than once, someone has come up to me at a ham radio event and mentioned one of my cartoons, which gave me a nice feeling.) A few years ago, I got to paint a cover illustration, and three years ago, I got to illustrate the early history of Pittsburgh's KDKA for a full-page feature.
>
> All good things, as they say, must come to an end. If CQ resumes publication, I hope they'll have me back.
>
> In the meantime, I'm available to illustrate your publication at reasonable rates. Email me at jaythurbershow@gmail.com.
>
> Would anyone like to rent a slightly used cartoonist?

You can see some of his work on the Spurious Signals Cartoons page.

My thanks to Zero Retries Pseudostaffer Jeff Davis KE9V for mentioning W3MCK's situation.

Hmmm…

Ebay - Rare Original TAPR TNC-1 Terminal Node Controller and Documentation from 1983

"Only" **$800.00**… *wow*. As of this writing, 0 bids.

ARDC Grant - Amateur Radio Evangelist

> **Date:** November 2023
> **Amount:** $18,000
>
> The mission of the Ham Radio Village (K0HRV) is to distribute high-quality, innovative amateur radio educational content; offer amateur radio-related hands-on experiences; and provide license testing sessions, both online and in person. With a team of dedicated volunteers, they organize the Ham Radio Village at DEFCON, give talks and demos of amateur radio at events beyond DEFCON, and offer support to the amateur radio community at large. The Ham Radio Village believes that more people in technical fields should have amateur radio licenses and that amateur radio is underrepresented in both the STEM/STEAM and maker communities. Currently, there is little outreach to these communities about the benefits of amateur radio in their fields.
>
> This grant will provide funding to both educate the aforementioned communities on amateur radio and streamline the process of them obtaining an amateur radio license. Specifically, they will reach out to scientific, engineering, hacker, maker, and STEM/STEAM focused conferences where attendees might have an interest in amateur radio (e.g., DEFCON, GRCon, Maker Faire, IEEE Communications Conference). From there, they will apply to, and if accepted, give a related talk and/or teach a one-day Technician Class license course and offer a Volunteer Examiner test session at the event(s). As a result, not only will these newly licensed hams obtain a lifelong hobby that aligns with their professional and technical interests, they can also bring their experiences and ideas to amateur radio, all of which leads to advancing the hobby.
>
> Learn more at
> https://hamvillage.org/

This… is *significant!* Ham Radio Village has existed for several years as an activity at DEF CON, and only recently (as I understand it) became a formal organization then a 501(c)(3) organization. With this grant it's funded to do this outreach (evangelism) to techies at *multiple* technical conferences where Amateur Radio can be *presented in a technical context* that's relevant to their interests as technical professionals.

This is a real win for Amateur Radio!

How to see 56 MHz of bandwidth...

Onno Benschop VK6FLAB on the FoAR (Foundations of Amateur Radio) mailing list:

> The other day I stumbled on a project called Maia SDR by Daniel EA4GPZ. Maia,

> spelled Mike Alpha India Alpha, is a star in the Pleiades cluster. The Maia SDR project homepage proclaims that it is “An open-source FPGA-based SDR project focusing on the ADALM Pluto”.
>
> …
>
> The Pluto has the ability to sample data at a rate of 61.44 mega samples per second or MSPS. That translates to a bandwidth of 56 MHz. A typical amateur radio has a bandwidth of 2.5 kHz.
>
> This bandwidth comes at a price. For starters, USB on the Pluto isn't fast enough to handle 56 MHz of data, so if you're using it as a remote radio over USB, you need to lower your expectations.
>
> However, the hardware itself can process data at that rate, as long as it stays inside the radio. So, if you had a way to process data inside the radio and a way to show what you did with the data across USB, you could use all of the 56 MHz at once.
>
> The Maia SDR project does exactly that. It processes the data and presents it to the world as a waterfall image, like the one you might have seen in WSJT-X, fldigi or SDR++.

My thanks to Ben Kuhn KU0HN for mentioning this interesting article *and* turning me onto the Foundations of Amateur Radio mailing list and transcriptions of that podcast. I’m now subscribed!

Leave a comment

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Feedback Loop

My Thanks to commenters for Zero Retries 0134- Tom Salzer, Brayden Wise, and Andrew McCaskey WA4MTP for providing additional information for subjects discussed in that issue. The exchanges between Wise and WA4MPT re: WhatThreeWords provided additional context.

If you provide feedback via email, I may excerpt your feedback or include it in full. Unless you specifically grant me permission to include your name, I won’t do so. Feedback may be lightly edited for clarity.

Join the *Fun* on Amateur Radio

If you’re not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*

- ***Founding Members*** **who generously support Zero Retries financially:**
  Founding Member 0000 - Steven Davidson K3FZT
  Founding Member 0001 - Prefers to Remain Anonymous 01

  Founding Member 0002 - Chris Osburn KD7DVD
  Founding Member 0003 - Don Rotolo N2IRZ
  Founding Member 0004 - William Arcand W1WRA
  Founding Member 0005 - Ben Kuhn KU0HN
  Founding Member 0006 - Todd Willey KQ4FID
  Founding Member 0007 - Merik Karman VK2MKZ
  Founding Member 0008 - Prefers to Remain Anonymous 14
  Founding Member 0009 - Prefers to Remain Anonymous 19

- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.

- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your QRZ page (or other web presence) and include a link:

  https://www.zeroretries.org

- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
  Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- Dan Romanchik KB6NU mentions "Zero Retries Interesting" topics so regularly on his

blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.

- Jeff Davis KE9V also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.
- Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!
- RTL-SDR Blog - *Excellent* coverage of Software Defined Radio units.
- TAPR Packet Status Register has been published continuously since 1982.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- HB9BLA Wireless by Andreas Spiess HB9BLA
- KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)
- Modern Ham by Billy Penley KN4MKB
- Tech Minds by Matthew Miller M0DQW

Zero Retries is currently using the Substack email publishing platform to publish Zero Retries. It's particularly suitable for small newsletters as you can get started for no cost.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ***1200+*** other subscribers:

Subscribe now

Please tell your co-conspirators about Zero Retries — just click:

Share Zero Retries

Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Email issues of Zero Retries are “instrumented” by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA, and linked to the Internet via **Starlink *Satellite* Internet Access**.

2024-01-19

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Blanket permission granted for TAPR to use any Steve Stroh content for the TAPR Packet Status Register (PSR) newsletter (I *owe* them from *way* back).

1

The links are *examples*; I’m not positing that these are currently capable of being integrated into a system that will have the capabilities I’m outlining.

2

Such systems can easily be built around modern battery systems to remain functional in the event of a power outage, including repeater units that make use of modern battery backup systems based around new technology than traditional, failure-prone, will inevitably age out, lead acid batteries.